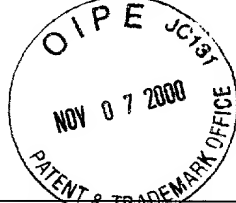



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FORM PTO-1390 (REV. 5-93)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	CASE NO. 10727/3
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (if known, see 37 C.F.R. 1.5) 09/674969
INTERNATIONAL APPLICATION NO. PCT/NO00/00098	INTERNATIONAL FILING DATE 21 March 2000	PRIORITY DATE CLAIMED 22 March 1999	
TITLE OF INVENTION METHODS IN TRANSMISSION OF FILES IN A DATA COMMUNICATION NETWORK			
APPLICANT(S) FOR DO/EO/US Arild Fuldseth et al.			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371			
2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371			
3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).			
4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.			
5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)).			
a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).			
b. <input type="checkbox"/> has been transmitted by the International Bureau.			
c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).			
6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).			
7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).			
a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).			
b. <input type="checkbox"/> have been transmitted by the International Bureau.			
c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.			
d. <input type="checkbox"/> have not been made and will not be made.			
8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).			
9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).			
10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)) and/or amendments under Article 34.			
Items 11. to 16. Below concern other document(s) or information included:			
11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.			
12. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.			
13. <input type="checkbox"/> A FIRST preliminary amendment.			
<input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.			
14. <input checked="" type="checkbox"/> A substitute specification. Headings in compliance with standard U.S. practice have been added.			
15. <input checked="" type="checkbox"/> A Power of Attorney and/or address letter.			
16. <input checked="" type="checkbox"/> Other items or information: Request, copy of first page of Priority Document, Notice Informing Applicant of Communication of the International Application to Designated Offices, Notification of Receipt of Record copy, Notification Concerning Submission or Transmittal of Priority Document, Notification of Transmittal of Search Report, Cited References			

U.S. APPLICATION NO. 097674969 <small>(If known, see 37 CFR 1.50)</small>		INTERNATIONAL APPLICATION NO. PCT/NO00/00098		CASE NO. 10727/3			
17. <input checked="" type="checkbox"/> The following fees are submitted: Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO \$860.00 International preliminary examination fee paid to USPTO (37 CFR 1.492(a)(1)) \$690.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.492(a)(2)) \$710.00 Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.492(a)(3)) paid to USPTO \$1,000.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 <div style="text-align: center; font-weight: bold; margin-top: 10px;">ENTER APPROPRIATE BASIC FEE AMOUNT</div>				CALCULATIONS		PTO USE ONLY	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e))							
Claims	Number Filed	Number Extra	Rate				
Total Claims	16- 20 =	0	x \$ 18.00	\$0.00			
Independent Claims	2- 3 =	0	x \$ 80.00	\$0.00			
Multiple dependent claim(s) if Applicable		0	+ \$270.00	\$0.00			
TOTAL OF ABOVE CALCULATIONS =				\$1000			
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28)				\$500.00			
SUBTOTAL =				\$500			
Surcharge of \$130.00 for furnishing the English translation later than the <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$			
TOTAL NATIONAL FEE =				\$500			
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31), \$40.00 per property +				40.00			
TOTAL FEES ENCLOSED =				\$540			
				Amount to be refunded			
				charged			
a. <input checked="" type="checkbox"/> A check in the amount of \$540 to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. 23-1925 in the amount of \$ to cover the above fees. A duplicate copy of this sheet is enclosed c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 23-1925. A duplicate copy of this sheet is enclosed.							
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.							
Send All Correspondence to: Brnks Hofer Gilson & Lione P.O. Box 10395 Chicago, IL 60610				 Signature F. David AuBuchon Name 20,493 Registration Number			

METHODS IN TRANSMISSION OF FILES IN A DATA COMMUNICATION NETWORK

FIELD OF THE INVENTION

5 The invention concerns methods in transmission in a data
communications network, particularly Internet, of arbitrarily formatted
files comprising one or more different data types, between a sender
comprising a data-processing device connected to the data
communications network, wherein the sender represents an information
10 provider, and one or more receivers with respective data-processing
devices connected with the data communications network, wherein each
receiver represents a user, wherein a dedicated server provided in or
assigned to the data communications network is used with the methods,
wherein files which shall be transmitted are stored in a database at the
15 sender or in a database accessible from the sender and which for the
transmission that substantially takes place transparently for both sender
and receiver, are downloaded to the data-processing device of the sender.

BACKGROUND OF THE INVENTION

The need for fast, effective and safe transmission of files for application purposes is rapidly increasing. Particularly this is the case in the media industry, where it is desirable with transmission of large files composed of different data types, including image information which is very capacity-demanding. Most of the information which is used in the media industry is present digitalized and transmitted in digital form and even though this can take place via existing broadband communications networks, the transmission of source information representing large data volumes, typically several Gbytes, yet becomes an expensive and for the user time-demanding process. Beyond all it is hence desirable to save time and costs in the transmission as well as making the transmission process more simple and efficient, something which will offer an end user great advantages compared with present file transmission systems. In a public

data communications network such as Internet, the traffic has only been increasing all the time, something which makes the transmission of large data volumes and large files on Internet both time-consuming and cost-demanding. For large data volumes or extensive documents it hence may be an alternative to make use of courier services or file transmission on dedicated ISDN lines. Even though such measures guarantee a safe transmission, they are yet linked with substantial costs and the use of courier services may in a large number of cases be unsuitable due to the time factor.

In connection with transmission of files data processing the files in connection with a transmission is well-known. Data processing of this kind can typically consist of various forms of compression coding in order to reduce the data volume which shall be transmitted, or measures in order to protect the data which are transmitted against copying. In international published patent publication WO98/44402 there is thus disclosed a method for copying protection of data which are downloaded from a server, typically via World Wide Web, to a client in order to be presented to a user. The transmitted and downloaded data are protected cryptographically by encryption and hashing. The processing to this end may then take place in a network server before transmission on e.g. the World Wide Web.

Further there is in a paper by Michael Fraase, "Compression pros deliver telecom with SITcom 1.0: Aladdin app offers transparent connection and compression" (MacWEEK, vol. 8, no. 2, 10. January 1994, page 43(2)) disclosed a telecommunication software which automatically can compress files during transmission using the so-called "Stuffit" tool from Aladdin Systems Inc. The users can use this software which is called "SITcomm" for automatically converting files or folder hierarchies to "Stuffit" archives before uploading or for automatically expand the archives as they are downloaded. SITcomm can also use a so-called

toolbox for implementing all connections, file transmissions and emulations.

From US patent no. 5 270 805 (Abe & al., assigned to Canon) there is additionally known a data-communication device which generate data as respectively character data and colour image data, these data being divided between respective block areas The block area for the image data can further be divided into further block areas in correspondence with the image characteristics of the image data. In each case the data transmission takes place blockwise and by means of a conversion device it is determined whether a function is present in the receiver device and the transmitted data in the block areas are converted according to this. This may e.g. then imply that if the receiver has no possibilities of processing a colour image, the colour image data will be converted to data which can be processed by the receiver.

BRIEF SUMMARY OF THE INVENTION

In many cases data is transmitted in files with a specific processing at the receiver in mind, e.g. for different applications, and advantageously a processing of this kind which basically has no connection to the transmission process as such could take place in connection therewith.

The object of the present invention is thus to provide methods which make a combined transmission and a non-transmission-related processing of data in files on public communications networks, e.g. Internet more efficient.

It is particularly the object that a transmission of files with accompanying specific processing shall take place with regard to a possible transmission-specific processing of the files and see to that the transmission of files between a sender and one or more receivers with

connected specific processing for a user and user-related applications is realized with fast and secure transactions between the parties.

It is also an object of the invention that large files shall be transmitted anywhere in the world and then by combining the transmission with a specific processing, without transmission and processing requiring unnecessary large data resources at the sender and receiver. The transmission and specific processing shall then take place substantially in transparency both for the sender and receiver, such that they can exploit their data resources for other tasks while the transmission itself takes place.

The above-mentioned objects and advantages are realized according to the invention with a method which is characterized by processing a file specifically for one or more users and/or one or more applications under determined conditions, the specific processing taking place consecutively in the server during the transmission and/or consecutively in the receiver's data processing device as the file is received and/or in the receiver's data processing device after the file has been received, and performing the processing with software which is stored in one or more of the following: the sender, the server or the receiver, and as required is transmitted before or in phase with the processing to a an actual processing location.

The above-mentioned method comprises advantageously consecutive or approximately simultaneous and/or interfoliated realized steps for

- a) compression-coding the file which shall be transmitted with a proprietary data compression procedure or a general loss-free data compression procedure,
- b) dividing the compression-coded file in packets,
- c) transmitting the packet-divided compression-coded file to the dedicated server together with receiver addresses,
- d) providing the packets with receiver address, and

e) transmitting the compression-coded file to one or more receivers according to the receiver addresses of the packets, as well as a further step, for

5 f) decoding the received file at the receiver according to the data compression procedure or procedures already used for the compression coding.

10 The above-mentioned objects and advantageous are additionally realized according to the invention with a method which comprises consecutive or approximately simultaneous and/or interfoliated realized steps for

a) compression-coding the file which shall be transmitted with a proprietary data compression procedure or a general loss-free data compression procedure,

b) dividing the compression-coded file in packets,

15 c) transmitting the packet-divided compression-coded file to the dedicated server together with receiver addresses,

d) providing the packets with receiver address, and

20 e) transmitting the compression-coded file to one or more receivers according to the receiver addresses of the packets, and as well as further steps for

f) decoding the received file at the receiver according to the data-compression procedure or procedures already used for the compression coding and additionally processing the files specifically for one or more uses and/or for one or more applications under determined conditions, the specific processing taking place consecutively in the server during the transmission and/or consecutively in the receiver's data-processing device as the file is received and/or in the receiver's data-processing device after the file has been received, and performing the processing with software which is stored in one or more of the following:

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the sender, the server or the receiver and which as required is transmitted before or in phase with the processing to an actual processing location.

According to the invention it is advantageous that the sender simultaneously with the initialization of the transmission of during or after the transmission to the server sending a message to the receiver with a resource address and an access code and receiving a confirmation from the server when the latter has received the file and the confirmation from the receiver when the latter has received the file and downloaded it to its data-processing device.

Where the arbitrarily formatted file comprises one or more of the following data types, viz. image data, alphanumeric data, graphics data and fonts, it is according to the invention advantageous using the proprietary data compression procedure for compressing image data, and using the general loss-free compression procedure substantially for compression of alphanumeric data, graphics data and fonts.

According to the invention is advantageous storing the software for data compression coding and decoding in the server and downloading said software automatically respectively to the data-processing device of the sender for coding the file when the transmission is initialized and to the data processing-device of the receiver for decoding the file when it is received.

In that connection packet-division preferably takes place dependent on the data type, such that each packet comprises a determined data type. According to the invention it is advantageous that the specific processing takes place in the server after a preceding decoding of the file in the server by means of the software for the data compression coding, the software for the processing either being stored at the sender and/or at the receiver and being transmitted to the data-processing device of the server when the processing shall take place, or beforehand stored in the data-processing

device of the server, and after the specific processing again compression-coding the file with software stored in the server for transmission to the receiver, the server on the basis of the receiver address checking whether processing conditions are present.

5 In that connection are preferably the processing conditions assigned to a determined receiver address being stored in the server together with software for the processing and being accessed by the server on the basis of the receiver address, and preferably the specific processing is then performed on one or more determined data types such that only packets
10 comprising the determined data type are decoded before the processing and coded anew after the processing has terminated.

According to the invention it is advantageous that the decoding of the file at the receiver takes place consecutively as the file is received. In that connection the specific processing preferably takes place
15 consecutively in the data-processing device of the receiver before and/or after the coding of the file which is received, the software for the processing either being stored at the receiver and/or in the sender and/or in the server and being transmitted to the data-processing device or the receiver when processing shall take place or before beforehand being
20 stored in the data-processing device of the receiver.

It can according to the invention also be advantageous storing the file as it is received in the data processing-device or receiver, and then decoding the file by the receiver at a later suitably selected time. In that connection the specific processing of the stored file can then preferably
25 take place in the data-processing device of the receiver before and/or after the decoding of the file, the software for the processing either being stored at the sender and/or in the server and transmitted to the data-processing device of the receiver when processing shall take place or beforehand entered in the data-processing device of the receiver.

According to the invention the dedicated server is advantageously implemented on a general network server.

According to the invention are user names, receiver addresses, files and the given processing conditions assigned to user names or receiver
 5 addresses preferably stored temporarily or permanently in a data base provided in the server.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention shall now be explained in more detail in connection
 10 with exemplary embodiments and with reference to the accompanying drawing, wherein:

FIG 1 shows a system layout for data transmission between a sender and several receivers, e.g. in a public data communications network such as Internet,

15 FIG. 2 the flow diagram for a preferred embodiment of the method according to the invention,

FIG. 3. the flow diagram for a first variant of the embodiment in FIG. 2, and

FIG. 4. the flow diagram for a second variant of the embodiment in
 20 FIG. 2.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 shows the system layout for file transmission in a public data communications network, e.g. Internet, such as known in the art. A
 25 number of information providers can be connected with the system and an information provider is here shown represented by the sender 1. The sender 1 comprises a data-processing device or computer 2 which well may be a personal computer and a database 3 connected with computer 2. In addition the sender 1 can optionally also communicate with one or more

external databases 4. These external databases 4 can be connected with a sender in a local network and stored on local data-processing devices which well may be the information provider's own. Alternatively the external databases 4 can be stored at other information providers and then

5 e.g. be accessed by the sender 1 via the public data communications network. The sender 1 is connected with and has at its disposal a dedicated server 5 which can be a free-standing data-processing device with a computer 6 and a database 7 connected thereto. The server 5 can e.g. be accessed via local network and or the public data communications network

10 and comprises in any case a not shown interface for such a public data communications network which e.g. then may be Internet. Alternatively the server 5 could also be implemented on the sender's own network server and the required data processing takes place on the sender's own computer. As a dedicated server in a data communications network the

15 server 5 can be a shared resource for several information providers and consequently be accessed from several senders 1. In regard of software the server is basically realized with two modules, one for reception of files and one for transmission of files to receivers. Additionally the server can comprise several modules, e.g. for processing of data, message switching

20 etc. The server's software will normally be stored in the database 7 assigned to the server, but this database can in its turn be a shared resource for several information providers or form a part of the sender's own database 3.

The server 5 can via the public data communications network

25 communicate with arbitrary number of receivers $8_1, 8_2, \dots, 8_k, \dots, 8_n$. This communication then takes place on the public available data communications network, e.g. Internet, via lines 9. The receivers are users of information and receive on request information transmitted from the information provider or the sender 1 in the form of files. The received

files can after downloading to the receiver 8 be processed on a data-processing device at the receiver, stored in a local data memory at the receiver and be utilized for a user-specific application at a time appropriate for the user.

5 It is a part of the object of the invention that the file transmission proper and all the operations which in this connection as executed by the server 5 take place substantially transparent to the sender as well as the receivers 8. This implies in practice that at least while the file transmission takes place, the data-processing devices of both the sender and the receivers or computer could be used for other tasks, as the file transmission operation as such shall not in any considerable degree shall load the mentioned computers.

10 A preferred embodiment according to the invention shall now be discussed with reference to FIG. 2, which renders a flow diagram showing the separate steps of the method. In this connection it shall be remarked that all references in the flow diagram to specific processing points to a user-specific or application-specific processing which has no consequences for the file transmission as such.

15 The embodiment of the method according to the invention is initialized at the start step 100 on the sender's 1 computer 2 as shown in FIG. 2. With the sender it is to be understood an information provider which serves a number of clients which are the receivers or users of the information. In step 101 the files which shall be transmitted are specified and fetched from the database 3 of the sender 1 or from databases 4 which can be accessed by the sender. These databases can be connected with the sender 1 in a local network or be accessed via the public data communications network which in the following will be supposed to be identical with Internet and denoted as such. It is to be understood that the file which shall be transmitted may consist of different types of source

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information which may well be located in several databases. Before the transmission all source information is in such a case collected in the file to be transmitted. The sender 1 also fetches receiver addresses, i.e. addresses to clients or users, preferably stored in the sender's own database 3. It is to be understood that files and documents collected may be formatted arbitrarily. They may e.g. be compression-coded beforehand with some appropriate compression procedure such as MPEG for video or films or JPEG for stills. The files can consist of a number of different data types as they do not need to consist of image information which in this case shall be understood as video images, film images or still images, but may in addition also comprise usual alphanumeric information, graphics information and possibly fonts. The latter will be relevant where alphanumeric and graphics information in the files at the users will be applied in media enterprises, e.g. the graphic industries. In step 102 the collected files now are compression-coded, as either a proprietary compression procedure or a particular loss-free data compression procedure is used. The proprietary data compression procedure can be a particular compression procedure for image information, possibly with an adaptation for stills or video. This proprietary compression procedure is developed by Fast Search & Transfer ASA, which has assigned the rights of use to the applicant. It will be relevant using it for those parts of the file which consist of image information. Other data types in the collected files as e.g. alphanumeric and graphics information can be compressed with a general loss-free procedure, such loss-free compression procedures being well-known to persons skilled in the art and hence not discussed in further details herein. As the collected file or parts thereof can be an arbitrarily formatted file, the file or parts thereof can as mentioned already be subjected to a compression procedure. A repeated data compression of image information in the form of video images which already have been

subjected to a compression of the MPEG type will with the applicant's proprietary compression procedure which has a higher compression factor than MPEG be further compressed. In other parts of the file which e.g. beforehand may have been subjected to a loss-free compression procedure, the general loss-free compression need not effect a further compression of these parts. In any case the compression coding in step 102 executed on the sender's own computer 2 which thereafter divides the collected compression-coded files in packets, such that each separate packet preferably contains a determined data type and at the sender has been subjected to a particular form of compression coding.

It is to be understood that the software used in the compression coding can be stored on the sender's own data-processing device, but preferably it is stored in the server 5 and will, when the file transmission is initiated, automatically be transmitted to the sender 1 from the server 5.

In step 104 the packet-divided compression-coded file is now transmitted from the sender's 1 computer 2 to a server 5 which well may be the sender's own network server or a dedicated server and connected with a server via e.g. a dedicated line, a local network or a public data communications network such as Internet. The sender 1 will now in step 5 inquire the server 5 whether the compression-coded file has been received and if the answer is NO the file transmission will continue until this is the case. Is the answer is YES and the compression-coded file is completely received on the server 5, the file is now provided with receiver address in the server's 5 computer 6 in step 106. The receiver address will e.g. be downloaded from the sender 1 to the server 5 at the start of the transmission. The receiver address may, however, also be an identification code and the intention is in any case that the receiver address or the identification codes are used in a step 107 implemented on the server 5, wherein a decision is taken whether the compression-coded files shall be

subjected to a specific processing in the server or not. If the answer is NO, a confirmation is sent in step 111 that the file has been received on the server 5 and simultaneously a confirmation is sent to the receiver 8, the confirmation comprising a message with a resource address (URL) and an access code, the latter e.g. a password for the user. In the present case the resource address will, of course, be the address of the server.

The decision in step 107 takes place on the basis of the receiver address or the identification code, e.g. with a table which for the relevant receiver address or identification code provides the server with the necessary processing instructions. If the answer in step 107 hence is YES, the file is decoded in step 108 and thereafter subjected to the required data processing, i.e. a specific processing in step 109. This processing can be user specific or application-specific and takes place with software which is stored in the data base 7 of the server 5 or which is transmitted to the database of the server, either on the basis of the receiver addresses when the file transmission starts or beforehand has been stored in the database 7 of the server 5 by the separate receiver. In this connection it is to be understood that step 111 very well may be realized in another location in the transmission process such that the confirmation can effect the transmission of the required software for the processing from either the sender or receiver before the decision in step 107 concerning the processing is made. The processing which takes place in step 109 can be user-specific or application-specific, i.e. the file is processed user-specifically for one or more users or receivers or application-specifically for two or more users, such that the file is subjected to the same processing for one and the same application or one and the same application is implemented at more than one user. The processing will as a rule take place by packet switching, e.g. be executed on packets which comprises image information and it is, of course, then

evident that not all packets in the file need to be decoded before the processing. A typical example of processing which is performed can be the processing of image information with the intention of providing the image information with an optimum colour profile for the relevant user's applications. An example of a colour profile of this kind is the so-called ICC standard which stands for International Color Consortium which was established in 1993 by 8 industrial enterprises in order to provide a standardized architecture and standardized components for colour handling in image information. Digitalized colour image data will both before and after the compression coding typically be present as an RGB code. After image information has been decoded for processing, the RGB format is converted to a CMYK colour format with the use of the ICC colour profile. For the sake of that, this could also be done on the sender's computer 2, but preferably step 109 is realized as shown on the server's computer 6. In this connection the ICC profile can be transmitted automatically to the server 5, e.g. from the sender 1 or from a receiver 8, but may also be prestored in the server. The ICC profile is in any case implemented in each case when the image information format after the decoding is converted from the RGB format to the CMYK colour format. After completed processing in the server 5 the file is again compression coded in step 110 and a confirmation is submitted as mentioned above in step 111 in the form of a message to the sender and a confirmation in the form of a message to the receiver 8. Whether the confirmation of the receiver in step 111 as mentioned is submitted at an early stage in the process or immediately after step 107 or step 110, the server 5 in step 112 will receive a transmission request from one or more receivers 8 and if the server in step 112 does not find such a transmission request for a receiver, an already compression-coded or processed file for the receiver can in step 104 either be stored in the server 5 for later transmission to the receiver or

be deleted. If the server 5 in step 112 on the contrary finds that a transmission request from one or more receivers is present, the server 5 transmits the compression-coded and in case also processed files to the respective receivers 8 on the basis of the receiver addresses, as each packet is addressed and transmitted consecutively after step 107 as the packets are received on the server 5 or consecutively following step 110, in any case on the basis of the received transmission request such this is present at step 112. The transmission from the server 5 to the receiver 8 takes place in step 114 and the file is downloaded consecutively in step 115. In step 116 a decision is made whether the file is downloaded, and if the answer is NO, the downloading of a compression-coded and possibly processed file in step 115 continues until the downloading is completed and confirmed in step 116 with YES. Then the receiver 8 in step 117 sends a confirmation in the form of a message to the sender 1 that the file has been downloaded. After the file has been received and downloaded to the receiver's computer, the latter decodes the file in step 118.

Advantageously a specific processing also may take place on the receiver's 8 own computer and a decision about a processing of this kind is taken in step 119. If the answer is YES, the downloaded file is processed in step 120 and it is default that the processing can comprise a number of separate processing steps and be executed on different data types. Where the user or receiver 8 represents media industry or graphic industry, it may of course be topical to implement a suitable colour profile in connection with conversion from one colour format to another. There is also nothing against a file which already has been subjected to a processing on the server 5 in step 109 or after the decoding at the receiver 8 in step 118 being processed further and user-specifically by the receiver 8 in step 120 such this alternative is evident from FIG. 2. Further can both the user-specific and application-specific processing wholly take place on

the receiver's own computer and without a preceding specific processing in step 109 in the server. This is shown in FIG. 3 wherein the answer in step 107 is NO and the loop with the steps 108-110 hence deleted, as specific processing now only takes place in step 120. If the answer in step 119 is NO, the transmission is finally complete and the entire process terminates in step 121 as shown both in FIG. 2 and FIG. 3.

It is also possible that certain forms of processing can be performed in the server 5 on a compression-coded file without a preceding decoding taking place. This alternative will, of course be expressed by a processing condition, but is not shown in FIG. 2. In practice this implies that steps 108 and 110 are deleted.

Correspondingly can also optionally a specific processing of compression-coded files take place in the receiver 8, without a preceding decoding. This is shown in FIG. 4 where processing on the basis of a decision in step 117 a will take place in step 117b, whereafter the file is decoded in step 118 and optionally after a decision in step 119, once again is subjected to a specific processing in step 120.

According to the invention the separate steps in the method are realized consecutively and approximately simultaneously such a step does not need to be terminated before the next has begun, as the separate operational steps in practice are performed by packet-switching. This implies in other words that the first packets in the file already can be downloaded at the receiver 8, while compression coding and packing of the last parts of the files still take place in the sender 1. Further it shall be understood that the succession of the separate steps may be different than shown in the flow chart in FIG. 2, which only schematically renders a preferred embodiment. In practice the operational steps can be interfoliated, i.e. that for instance decoding and downloading of not-processed packets in step 115 in time may well precede the processing

in step 109. Also the steps for transmission of confirmations between the acting parties, i.e. the sender 1, the server 5 and the receiver 8 can be located differently in the sequence of steps. A confirmation to receiver 8 with resource address, file reference and password can for instance take place already before the transmission starts and then of course from the sender 1 to the receiver 8. Correspondingly the server 5 can confirm the transmission with a message to the sender 1 immediately after in step 107. Yet it is regarded as most suitable that the confirmations are given in the form of messages from the server to respectively sender and receiver after a possible processing in the server has been terminated. Further, a confirmation in step 111 will usually cause the server 5 to receive a transmission request from the receiver 8 at step 112, but a transmission request may well be entered beforehand on the basis of an already submitted message from the sender 1.

It is, of course, no requirement that the decoding of the file in step 118 takes place consecutively as the file is downloaded. The receiver 8 can choose to download the file without decoding and thereafter store the compression-coded and possibly already processed file on his own computer for a shorter or longer time period with regard to a later application. As the file already is compression-coded the storage will require little space. The decoding of stored file can then take place at a later time and be combined with a possible user-specific or application-specific processing on the receiver's own computer. Neither is it, of course, anything against performing the processing or parts thereof on the stored compression-coded file, i.e. before the decoding takes place, but in most cases the file will be processed in connection with the decoding and then as this takes place, e.g. for an application requirement which shall be met on a suitable time for the receiver or user after the file has been transmitted or stored on the data-processing device of the user.

The method in file transmission according to the present invention also provides great flexibility with regard to storage and downloading of the required software for e.g. processing. Suitably may as mentioned the software for the compression coding for instance be stored at the server 5 and automatically be downloaded to the sender 1 when the transmission is initialized, but it can of course also be prestored at the sender.

Correspondingly can software for the specific processing be stored at the sender 1 as well as the server 5 and/or the receiver 8 and transmission of software of this kind be implemented automatically when e.g. a decision on processing is taken irrespective of whether it takes place at the sender, server or receiver.

The methods in transmission of files according to the present invention will be well suited for file transmission of text and images on Internet with applications in the media industry in regard. By systematically using the compression procedure based on respectively the applicant's own data compression technology for image information and commonly known loss-free compression procedures for text and fonts, a file transmission with a particular large capacity is obtained while the transmission costs are reduced. The applicant's own data compression technology is many times as effective as e.g. the known standards such as JPEG and MPEG with regard to compression speed, while the quality of the decoded information in regard of e.g. colour rendition and resolution is far better. For instance can large image files in the present method be compressed by more than 98% and transmitted via Internet anywhere in the world without causing an appreciably reduced image quality. The transmission additionally takes place very fast – as a rule the confirmation that a downloading has taken place will appear just as fast as it shall take to write the corresponding data to a common CD-ROM.

As mentioned, the methods according to the present invention shall be particularly well suited in the media industry. As more and more tasks in the media industry apply digitally-based information, this requires an effective file transmission. Simultaneously the files can in connection with the transmission be subjected to a specific processing and this processing shall, regardless of where it takes place, similar to other procedures during the transmission substantially take place in transparency both to sender and receiver. In the present method the demand for lines with high bandwidth is eliminated by far, as the specific processing does not affect the bandwidth requirement in the transmission, and owing to the use of e.g. the above-stated compression factor, it will be possible to obtain a virtual processing rate of the magnitude 10 Gbit/h on an ordinary ISDN line. If a transmission line with the fixed band-width of 2Mbit/s is used, it will with the method according to the present invention and under the same conditions be achieved a virtual transmission capacity of 360 Gbit/h even though the file in the transmission is subjected to a specific non-transmission-related processing. The virtual transmission capacity for a given line is in other words only dependent on the compression factor, but implies for the receiver or user when the transmission takes place with a compression factor of 50 which is very far from an upper limit of the applicant's own data compression technology, an essential improvement of the performance even when it is compared with the up to now used methods on Internet for data transmission without specific processing. Finally it is to be understood that the herein disclosed methods according to the invention shall not be incompatible with the corresponding specific processing in the sender according to predetermined criteria. The processing will then take place before the compression coding in step 102, and in the division in packets will not only the data type be taken in regard, but also the possible specific processing. A specific processing of

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PATENT CLAIMS

1. A method in the transmission in a data communications network, particularly Internet, of arbitrarily formatted files comprising one or more different data types, between a sender comprising a data-processing device
 5 connected to the data communications network, wherein the sender represents an information provider, and one or more receivers with respective data-processing devices connected with the data communications network, wherein each receiver represents a user, wherein a dedicated server provided in or assigned to the data
 10 communications network is used with the method, wherein files which shall be transmitted are stored in a database at the sender or in a database accessible from the sender and which for the transmission that substantially takes place transparently for both sender and receiver, are downloaded to the data-processing device of the sender, and wherein the
 15 method is characterized by processing a file specifically for one or more users and/or one or more applications under determined conditions, the specific processing taking place consecutively in the server during the transmission and/or consecutively in the receiver's data-processing device as the file is received and/or in the receiver's data-processing device after
 20 the file has been received, and performing the processing with software which is stored in one or more of the following: the sender, the server or the receiver, and as required is transmitted before or in phase with the processing to a an actual processing location.

2. A method according to claim 1,
 25 characterized by comprising consecutive or approximately simultaneous and/or or interfoliated realized steps for

a) compression-coding the file which shall be transmitted with a proprietary data compression procedure or a general loss-free data compression procedure,

b) dividing the compression-coded file in packets,
 c) transmitting the packet-divided compression-coded file to the
 dedicated server together with receiver addresses,
 d) providing the packets with receiver address, and
 5 e) transmitting the compression-coded file to one or more receivers
 according to the receiver addresses of the packets, as well as a further
 step, for
 f) decoding the received file at the receiver according to the data
 compression procedure or procedures already used for the compression
 10 coding.

3. A method in transmission in a data communications network,
 particularly Internet, of arbitrarily formatted files comprising one or more
 different data types, between a sender comprising a data-processing device
 connected to the data communications network, wherein the sender
 15 represents an information provider, and one or more receivers with
 respective data-processing devices connected with the data
 communications network, wherein each receiver represents a user,
 wherein a dedicated server provided in or assigned to the data
 communications network is used with the method, wherein files which
 20 shall be transmitted are stored in a database at the sender or in a database
 accessible from the sender and which for the transmission that
 substantially takes place transparently for both sender and receiver, are
 downloaded to the data-processing device of the sender, and wherein the
 method is characterized by comprising consecutive or approximately
 25 simultaneous and/or interfoliated realized steps for

a) compression-coding the file which shall be transmitted with a
 proprietary data compression procedure or a general loss-free data
 compression procedure,

b) dividing the compression-coded file in packets,

c) transmitting the packet-divided compression-coded file to the dedicated server together with receiver addresses,
 d) providing the packets with receiver address, and
 e) transmitting the compression-coded file to one or more receivers
 5 according to the receiver addresses of the packets, and as well as further steps for

f) decoding the received file at the receiver according to the data compression procedure or procedures already used for the compression coding and additionally processing the files specifically for one or more
 10 uses and/or for one or more applications under determined conditions, the specific processing taking place consecutively in the server during the transmission and/or consecutively in the receiver's data-processing device as the file is received and/or in the receiver's data processing-device after the file has been received, and performing the processing with software
 15 which is stored in one or more of the following: the sender, the server or the receiver and which as required is transmitted before or in phase with the processing to an actual processing location.

4. A method according to claim 3,
 characterized by the sender simultaneously with the initialization of
 20 the transmission of during or after the transmission to the server sending a message to the receiver with a resource address and an access code and receiving a confirmation from the server when the latter has received the file and the confirmation from the receiver when the latter has received the file and downloaded it to its data-processing device.

25 5. A method according to claim 3, wherein the arbitrarily formatted file comprises one or more of the following data types, viz. image data, alphanumeric data, graphic data and fonts,

characterized by using the proprietary data compression procedure for compressing image data, and by using the general loss-free

compression procedure substantially for compression of alphanumeric data, graphics data and fonts.

6. A method according to claim 3,
characterized by storing software for data compression coding and
5 decoding in the server and downloading said software automatically
respectively to the data-processing device of the sender for coding the file
when the transmission is initialized and to the data-processing device of
the receiver for decoding the file when it is received.

7. A method according to claim 3,
10 characterized by the packet division taking place dependent on the
data type, such that each packet comprises a determined data type.

8. A method according to claim 3,
characterized by the specific processing taking place in the server
after a preceding decoding of the file in the server by means of the
15 software for the data compression coding, the software for the processing
either being stored at the sender and/or at the receiver and being
transmitted to the data-processing device of the server when the
processing shall take place, or beforehand stored in the data-processing
device of the server, and after the specific processing again
20 compression-coding the file with software stored in the server for
transmission to the receiver, the server on the basis of the receiver address
checking whether processing conditions are present.

9. A method according to claim 8,
characterized by the processing conditions assigned to a determined
25 receiver address being stored in the server together with software for the
processing and being accessed by the server on the basis of the receiver
address.

10. A method according to claim 8,
characterized by performing the specific processing on one or more

determined data types such that only packets comprising the determined data type are decoded before the processing and coded anew after the processing has terminated.

11. A method according to claim 3,

5 characterized by the decoding of the file at the receiver taking place consecutively as the file is received.

12. A method according to claim 11,

characterized by the specific processing taking place consecutively in the data-processing device of the receiver before and/or after the coding of the file which is received, the software for the processing either being
10 stored at the receiver and/or in the sender and/or in the server and being transmitted to the data-processing device or the receiver when processing shall take place or before beforehand being stored in the data-processing device of the receiver.

13. A method according to claim 3,

characterized by storing the file as it is received in the data-processing device or receiver, and then decoding the file by the receiver at a later suitably selected time.

14. A method according to claim 13,

20 characterized by the specific processing of the stored file taking place in the data-processing device of the receiver before and/or after the decoding of the file, the software for the processing either being stored at the sender and/or in the server and transmitted to the data-processing device of the receiver when processing shall take place or beforehand
25 entered in the data-processing device of the receiver.

15. A method according to claim 3,

characterized by the dedicated server being implemented on a general network server at the sender.

ABSTRACT

In a method in the transmission in a data communications network of arbitrarily formatted files between a sender which represents an information provider and one/or more receivers which represent users, a network server is used in the transmission, the transmission itself taking place substantially transparent to both sender and receiver. Before the transmission a file which shall be transmitted is compression-coded, whereafter it is transmitted packet-divided via the server to the receiver. In the transmission an already compression-coded file is subjected to a processing specific for one or more users and/or one or more specific applications, either in the server or in the receiver or both, without any effects on the transmission as such. Software used for the processing can be stored either at the sender, server or receiver and possibly downloaded automatically to the processing location. The particular operational and decision steps in the method are preferably realized in consecutive and approximately simultaneous and/or interfoliated steps.

Use for transmission and specific processing of large files comprising one or more different data types, including image information on the Internet, particularly for use in the media industry.

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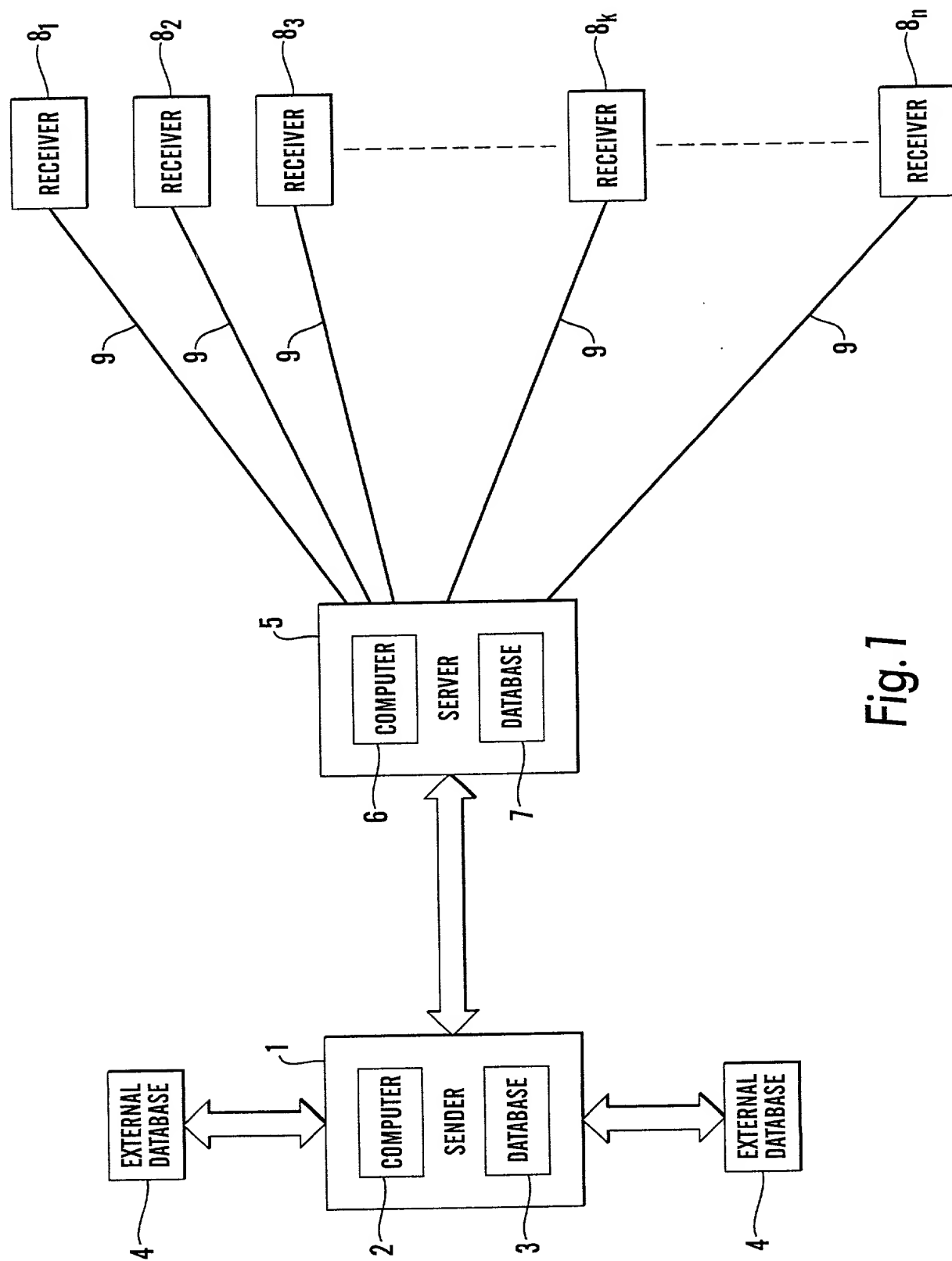


Fig. 1

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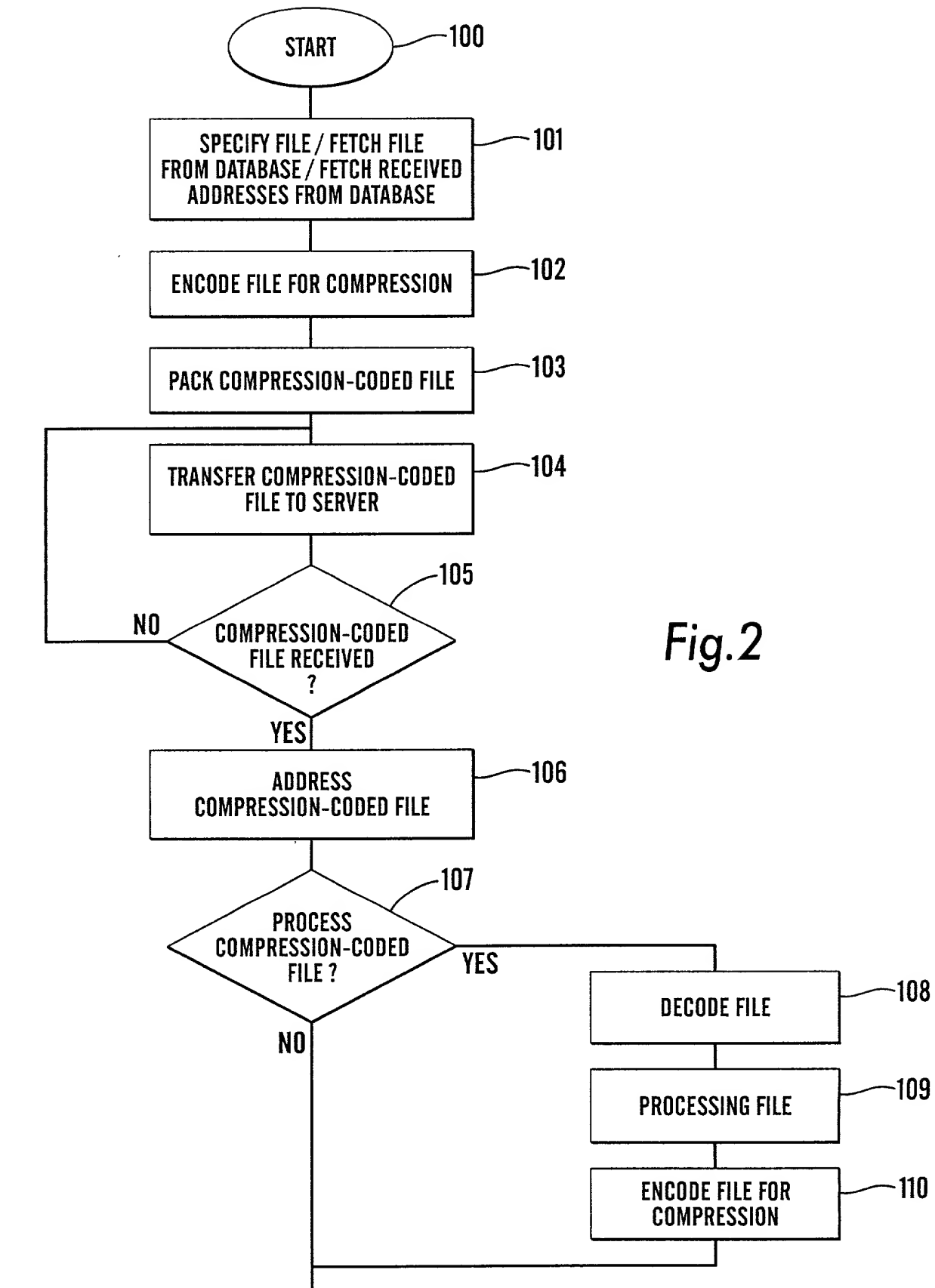


Fig.2

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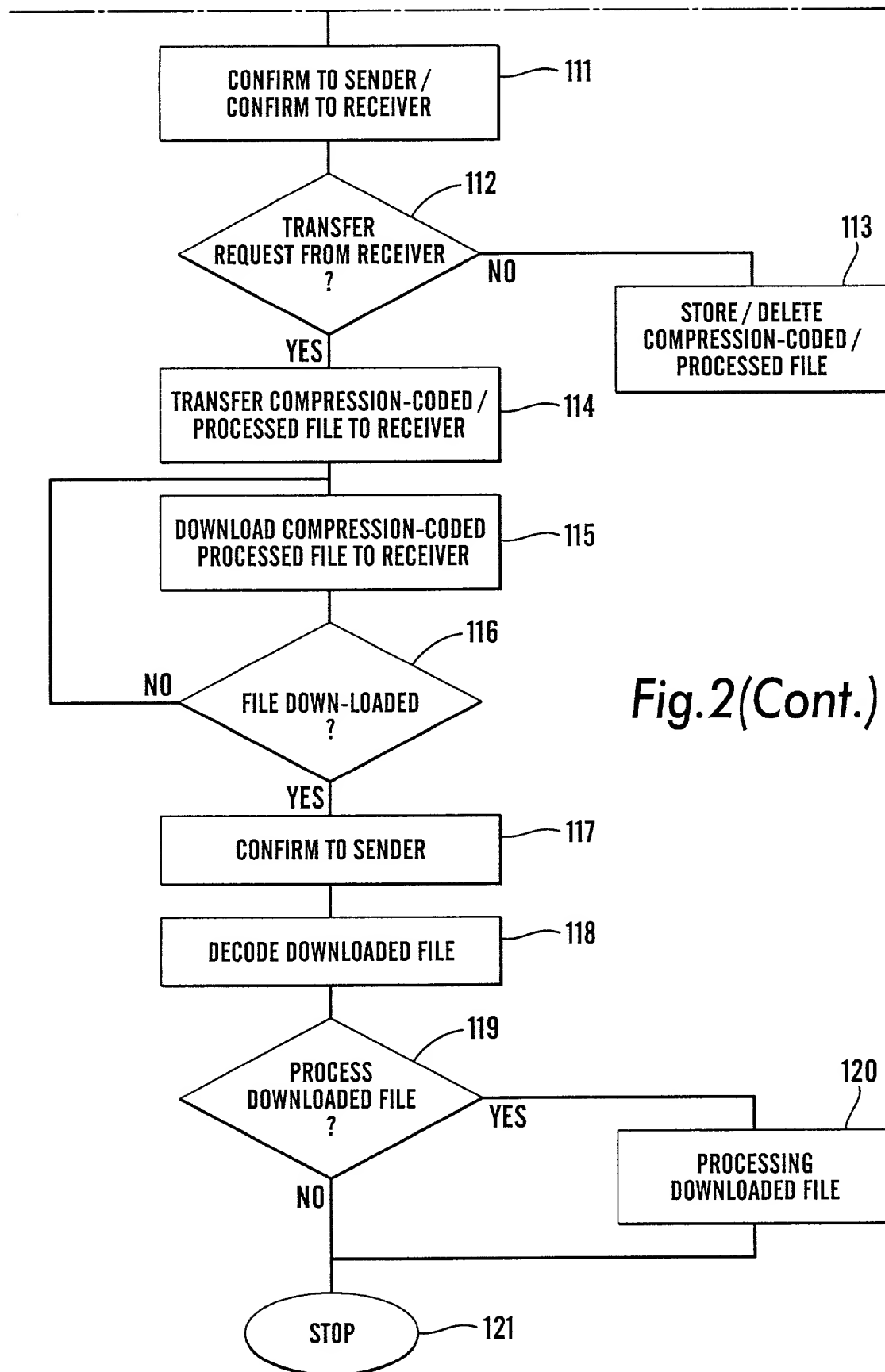


Fig.2(Cont.)

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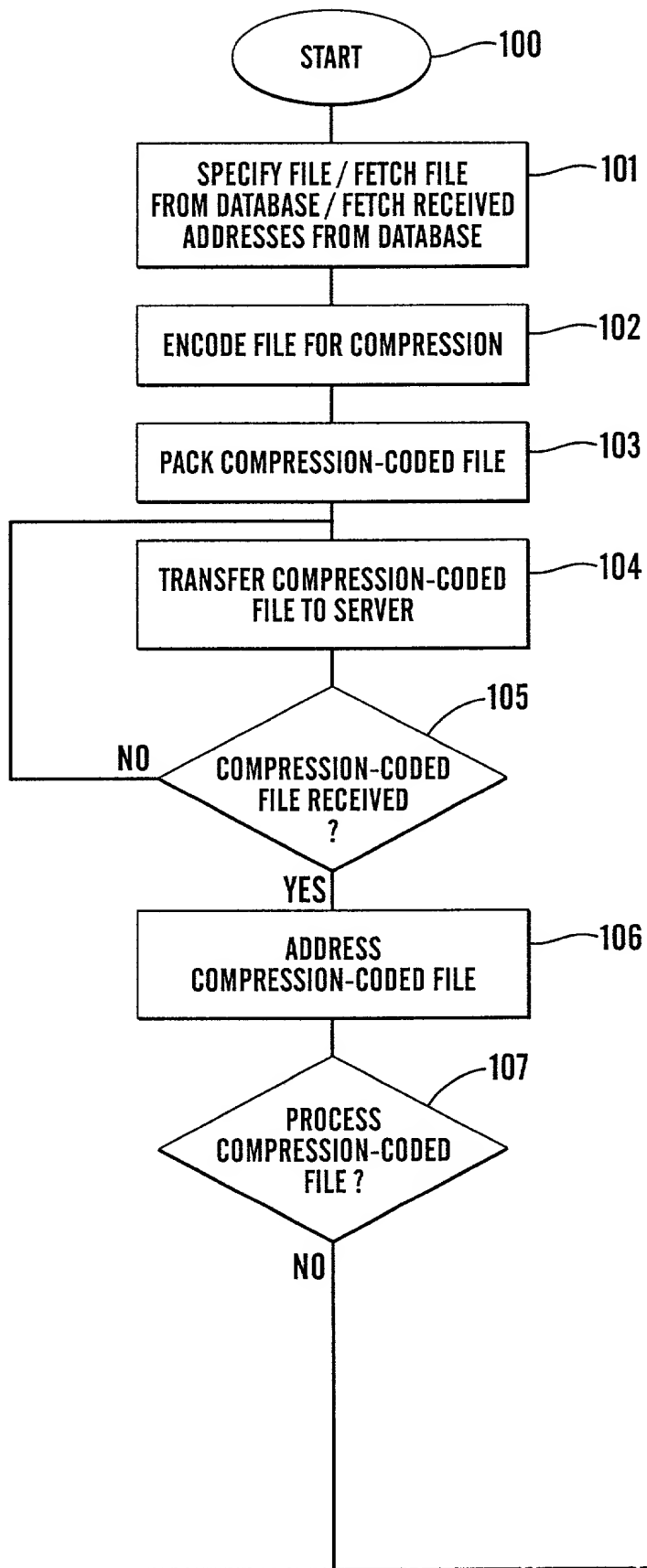
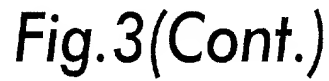


Fig.3



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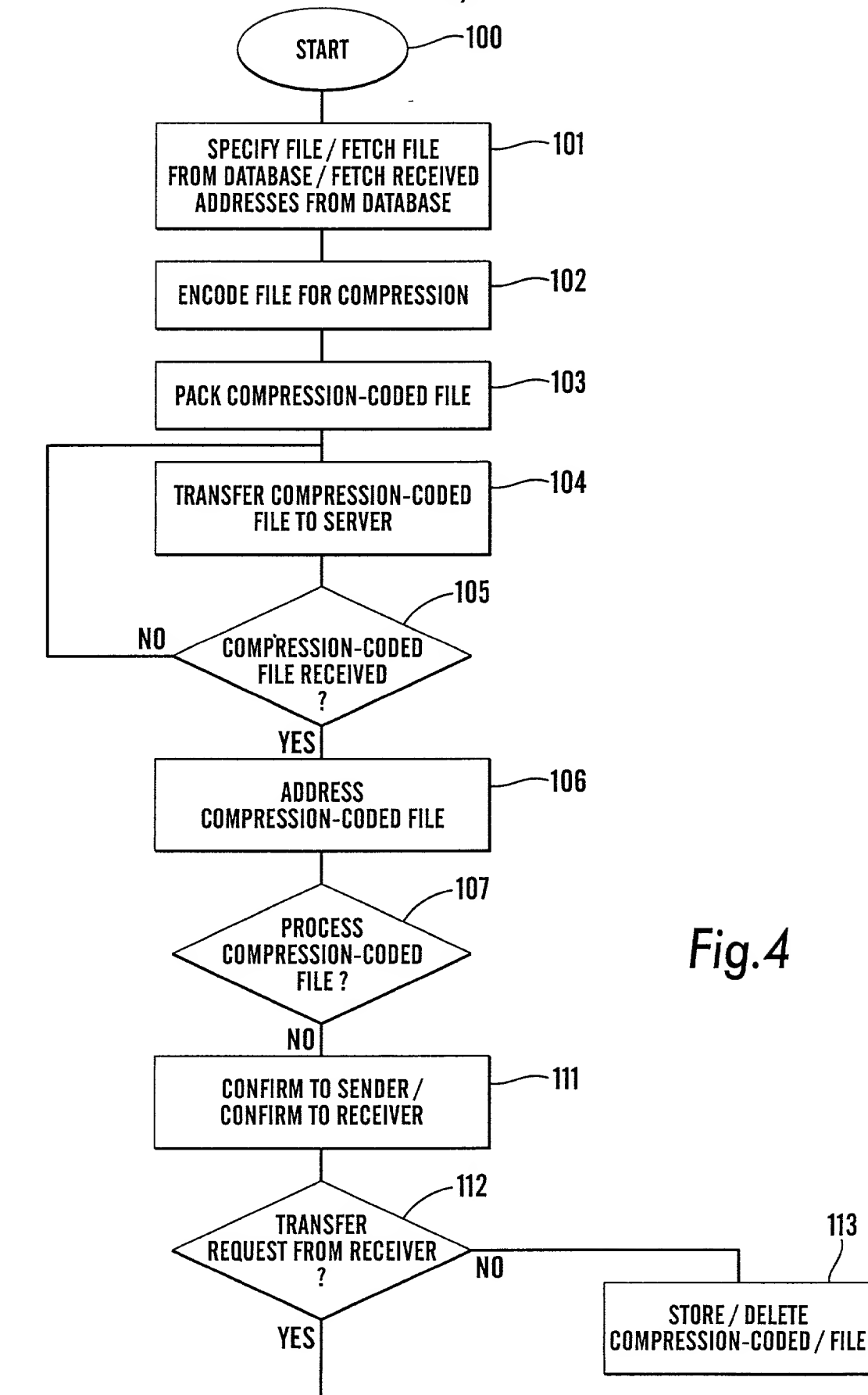
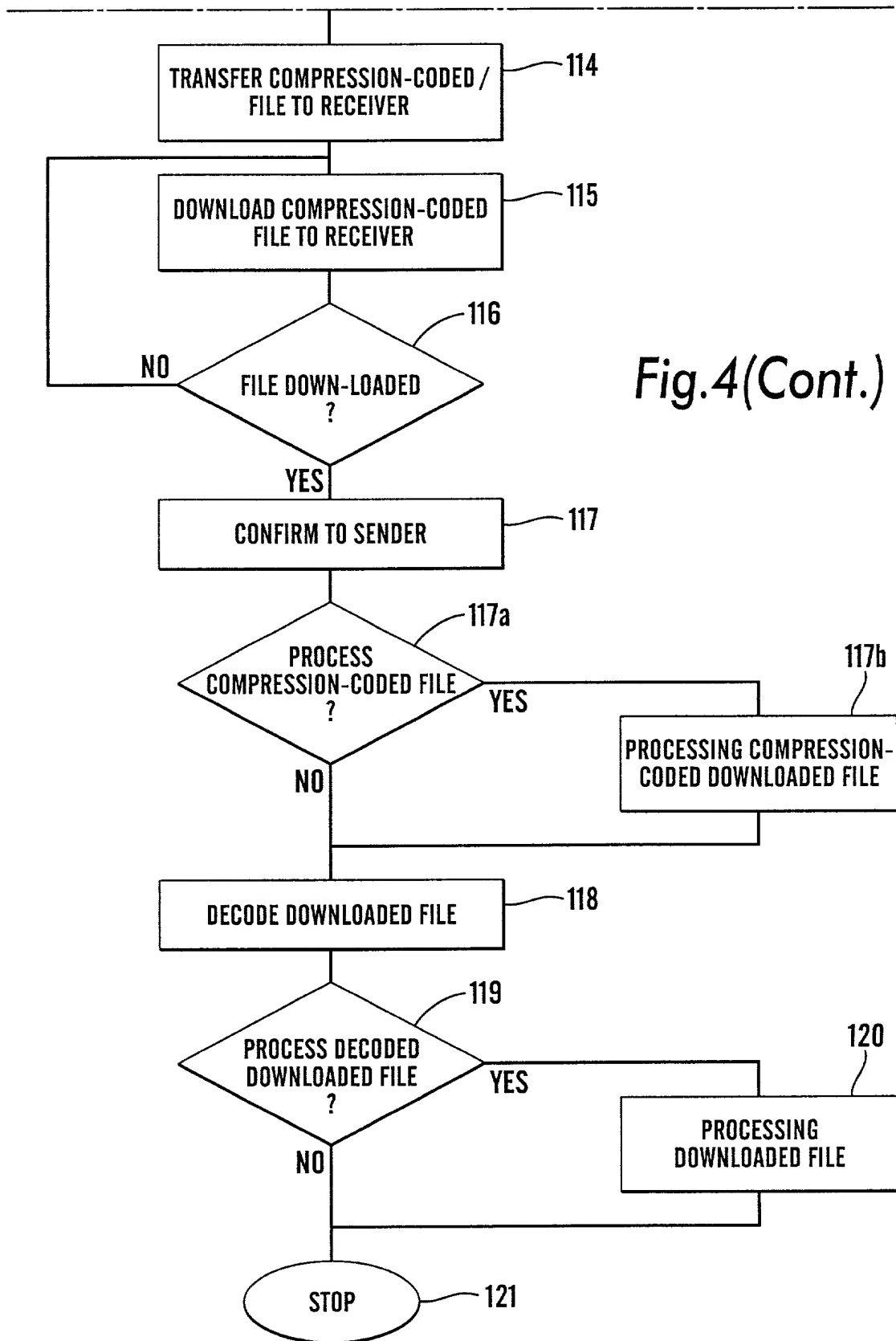


Fig.4

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Title: Methods in transmission of file,s in a data communication network

POWER OF ATTORNEY

The specification of the above-identified patent application:

☒
☐

is attached hereto
was filed on _____ as application Serial No.

I hereby revoke all previously granted powers of attorney in the above-identified patent application and appoint the following attorneys to prosecute said patent application and to transact all business in the Patent and Trademark Office connected therewith:

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The undersigned hereby authorizes the U.S. attorneys named herein to accept and follow instructions from F. David AuBuchon as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorneys named herein will be so notified by the undersigned.

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DECLARATION FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Methods in transmission of files in a data communication network the specification of which:

- ☒ is attached hereto.
☐ was filed on _____ as Application Serial No. _____.
☐ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability as defined in Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Claimed

19991371

Norway

22 March 1999

☒

☐

(Number)

(Country)

(Day/Month/Year Filed)

Yes

No

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

PCT/NO00/00098

21 March 2000

None

(Application Serial No.)

(Filing Date)

(Status-patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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